

WHAT IS CLAIMED IS:

1. A kneading machine comprising:

- a rotating tank that is substantially cylindrical;
and

5 - a pair of kneading implements (turning within the tank, with concordant directions of rotation, about two axes parallel to the axis of the tank, which are substantially tangential both to one another and to the circumferential wall of the tank,

10 wherein:

- each implement comprises at least one arm;
- each arm extends on the periphery, and from one end to the other of the theoretical cylinder that has an axis that is coincident with the respective axis of rotation
15 of said arm, in such a way that said arm describes an orbital movement about the respective axis of rotation;

- each arm, at least for a part of its length, is inclined with respect to a straight line generatrix of said theoretical cylinder parallel to said axis of
20 rotation of the arm;

- the opposite ends of the two arms are staggered with respect to one another, viewed in the direction of the axis of rotation, by an angle smaller than 180° about said axis of rotation;

25 - means are provided for causing said arms to have orbital movements about the respective axes of rotation that are synchronized with respect to one another, in such a way that the arms pass simultaneously in the area of tangency of the respective theoretical cylinders,
30 intersecting one another with opposite directions of movement on account of the concordant rotation of the two implements.

2. The kneading machine according to Claim 1, wherein said arms are inclined in a concordant way with respect
35 to the generatrices of their theoretical cylinders in

such a way that at their intersection in the aforesaid area of tangency they are arranged so that they cross one another, according to a scissors-like configuration.

3. The kneading machine according to Claim 2, wherein
5 each arm is set according to a portion of helix extending on the periphery of its theoretical cylinder, and from one end to the other of said cylinder, according to an angle smaller than 180° , viewed in the direction of the axis of rotation.

10 4. The kneading machine according to Claim 3, wherein the two aforesaid theoretical cylinders have diameters that are substantially equal and heights that are substantially equal, the two portions of helix defining on said arms are substantially equal, and the speeds of
15 rotation of the arms are also substantially equal, so that the area of tangency of the two arms shifts progressively during their intersection in a direction parallel to the axes of the two theoretical cylinders and from one end to the other of said cylinders.

20 5. The kneading machine according to Claim 1, wherein each of the aforesaid theoretical cylinders has a diameter that is sufficiently large so that said cylinder has overall dimensions that exceed the limits of the respective quadrant of tank.

25 6. The kneading machine according to Claim 5, wherein the two kneading implements constitute the only members present inside the tank.

30 7. The kneading machine according to Claim 1, wherein the aforesaid angle of staggering of the two opposite ends of each arm is between 20° and 100° , and is preferably between 20° and 45° .

8. The kneading machine according to Claim 3, wherein the aforesaid portion of helix has an angle of inclination between 15° and 40° .

35 9. The kneading machine according to Claim 8, wherein

the aforesaid angle of inclination of the portion of helix is equal to approximately 20°.

10. The kneading machine according to Claim 1, wherein the two arms present respective cutting edges 30, which
5 are set opposite to one another when the two arms 13a cross one another.

11. The kneading machine according to Claim 10, wherein the arms have a cross section of square shape.

12. The kneading machine according to Claim 10,
10 wherein the arms have a cross section of trapezoidal shape.

13. The kneading machine according to Claim 10, wherein said arms have a cross section of rhomboidal shape.

14. The kneading machine according to Claim 1, wherein
15 one of the two kneading implements may be replaced with a fixed contrast member that is substantially tangential to the theoretical cylinder of the other kneading implement.